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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,161	04/25/2001	Jeremy Sommer	SYMM:031US/JJB	8582

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EXAMINER
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LIU, SHUWANG

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/843,161	SOMMER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shuwang Liu	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-17 and 20-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3, 6-11, 16, 17 and 20-30 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1, 12-15, 22, 26-29, 35-36 and 38-41 have been considered but are moot in view of the new ground(s) of rejection because of the amendments. The rejections under USC 35 112 are withdrawn.

### ***Claim Objections***

2. Claim 3 is objected to because of the following informalities:

In claim 3, line 1, "said input signal in the first" should be - -said second input signal in the second- -.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 6-11, 16, 17 and 20-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leslie et al. (US 5,095,528) in view of anticipated by Erreygers (US 6,236,664).

As shown in figures 1-3, Leslie et al. discloses a method, comprising an extending loop (foe example, figure 1) including:

(1) regarding claims 1, 20, 22, 23, and 24:

producing an output signal in a first direction (via 16) from a first variable gain amplifier (16) at a mid-span extender unit (repeater, see column 1, lines 16-22) responsive to an input signal (output from 14);

monitoring (62 in figures 3a and 82 in figure 3b) a signal strength in the first direction at the of said output signal (see claim 1);

generating a gain control signal (output from 18) responsive to said signal strength (see claim 1 and column 3, lines 22-51);

controlling (35) a first gain of said first variable gain amplifier responsive to said gain control signal (see claim 1 and column 3, lines 22-51); and

controlling a second gain of a second variable gain amplifier (24) at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction (via 24) from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said subscriber loop (see claim 1 and column 3, lines 22-51).

Furthermore, controller coupled to said variable gain amplifier, said controller generating a gain control signal that is both i) feed back to said variable gain amplifier to automatically control said gain (see figure 2, for example, the feedback via 18 and 40) and ii) feed back to said another variable gain amplifier (via 18 and 46) to automatically control said another gain as recited in claim 22

Leslie et al. all of the subject matter as described above except for specifically teaching of the mid-span extender unit within in a digital subscriber loop.

Erreygers teaches that the digital subscriber loop extender circuit (repeater) is interposed at an intermediate point of said asymmetric digital subscriber loop to extend said asymmetric digital subscriber loop (see figure 2).

It would be desirable to have amplifiers in the digital subscriber loop, which are provided for amplifying at least the intelligence carrying portion of the two direction signals so as to automatically reduce or increase the gain of the repeater (column 1, lines 37-54 and column 2, lines 1-14, Leslie et al.). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the repeater of Leslie et al. to the digital subscriber loop of Erreygers in order to be able to automatically adjust the gain of the repeater. In so doing, the repeater is provided for amplifying at least the intelligence carrying portion of the two direction signals in the digital subscriber loop.

(2) regarding claim 2:

Furthermore, Erreygers teaches the input signal in the first direction originates from a customer-premise side (20) of said digital subscriber loop.

(3) regarding claim 3:

Furthermore, Erreygers teaches the second input signal in the second direction originates from a central office side (10) of said digital subscriber loop.

(4) regarding claims 6, 7 and 25:

wherein monitoring includes monitoring the signal strength using a peak detector

(5) regarding claims 7 and wherein generating said gain control signal includes

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generating said gain control signal using an automatic gain control loop filter (for example, 46).

(5) regarding claims 8-10:

Further, Leslie et al. teaches controlling gain of the first variable gain amplifier (16) includes discrete value of gain (column 3, lines 28-37) which may be chosen one of eight, four or two discrete values (see the Remark in the response to the rejection under the 35 USC 112 1<sup>st</sup> in the previous office action).

(6) regarding claim 11:

further comprising detecting (18) whether a downstream signal is present on said subscriber loop (column 2, lines 65-column 3, line 2).

(7) regarding claim 16:

wherein controlling gain includes forcing a link termination (for example, cell site, it is inherent for the communication between mobile and cell size).

(8) regarding claim 17:

wherein controlling said gain includes reestablishing a link (for example, cell site, it is inherent for the communication between mobile and cell site).

(9) regarding claim 21:

wherein generating the gain control signal includes establishing a control voltage as a function of the signal strength of the output signal (column 4, line 37-column 5, line 53).

(10) regarding claims 26-29:

Furthermore, Erreygers teaches that (1) the signal generator includes a discrete multi-tone asymmetric digital subscriber loop transmission unit (62); and (2) the digital subscriber loop extender circuit is interposed at an intermediate point of said asymmetric digital subscriber loop to extend said asymmetric digital subscriber loop, wherein said intermediate point lies between a provider end and a subscriber end (see figure 2). It is also inherent that gain is a function of a loop length.

5. Claims 28, 29, 35, 36, and 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leslie et al. and Erreygers as applied to claims 22 above, and further in view of Harrls et al. (US 6,023,612).

Leslie and Erreygers disclose all of the subject matter as described above except for specifically teaching the variable gain amplifier includes a voltage-controlled amplifier chain.

Harrls teaches that a voltage-controlled amplifier chain as shown in figure 8.

It would be desirable to have flexible and efficient amplification for the repeater by using amplifier chain in the communication system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the amplifier chain as taught by Harrls in the repeater of Leslie and Erreygers in order to increase the dynamic range of a transmission link and provide more flexible and efficient amplification the ADSL system.

***Allowable Subject Matter***

6. Claims 12-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach and suggest that the controlling gain of the variable gain amplifier includes determining when to change the gain based on at least one elapsed gain interval as recited in claims.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is 571 272-3036. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shuwang Liu  
Primary Examiner  
Art Unit 2634

August 2, 2005